WP4C120-18 Marine propulsion engine

Basic engine specifications

Rating	P1
Rated power-kW	88
Rated speed-rpm	1800
Overload power-kW	97
Overload speed-rpm	1858
Rated power tolerance-%	±3
Low idle speed -rpm	650
High idle speed-rpm	1980
Nº of Cylinders / Valves	4/8
Cylinders arrangement	In-line
Thermodynamic cycle	4 stroke
Bore × Stroke-mm(in)	105×130 (4.13×5.12)
Compression ratio	18:1
Displacement-L(in³)	4.5 (274.6)
Fuel system	Mechanical
Injection system	Direct injection
Aspiration	Turbocharged and aftercooled
Flywheel housing/Flywheel/N° of teeth on flywheel ring gear(standard)	SAE 1/14"/145
Flywheel housing/Flywheel/N° of teeth on flywheel ring gear(optional)	SAE 3/11.5"/131
Firing order	1-3-4-2
Rotation(from flywheel end)	Counterclockwise
Overall dimensions(L×W×H)-mm(in)	1063×818×1056 (41.9×32.2×41.6)
Dry weight-kg(lb)	600±50 (1323)
Wet weight-kg(lb)	615±50 (1356)
Max. output power of front end-kW(Ps)	7.24 (9.8)
Emission compliance	IMO Tier II
Lifting cylinder height- m(ft)	0.8 (2.62)

Rating definitions

Continuous Duty (P1)

The engine can run at full load continuously. The average load factor is 70% to 100%. Annual working time is recommended but not limited to 5000h～8000h.

Heavy Duty (P2)

The engine can run at full load for 8h every 12h. The average load factor is 40% to 80%. Annual working time is recommended but not limited to 5000h.

Intermittent Duty (P3)

The engine can run at full load for 4h every 12h. The average load factor is 40% to 80%. Annual working time is recommended but not limited to 3000h.

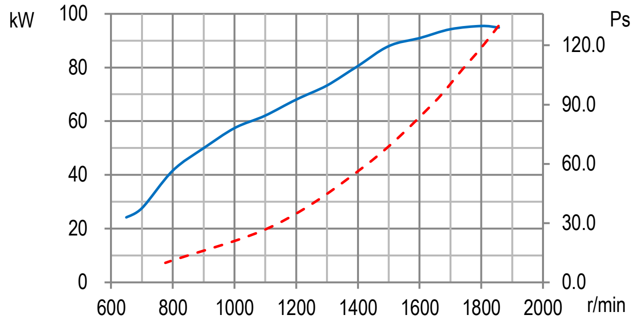
Light Duty (P4)

The engine can run at full load for 2h every 8h. The average load factor is about 60%. Annual working time is recommended but not limited to 1000h.

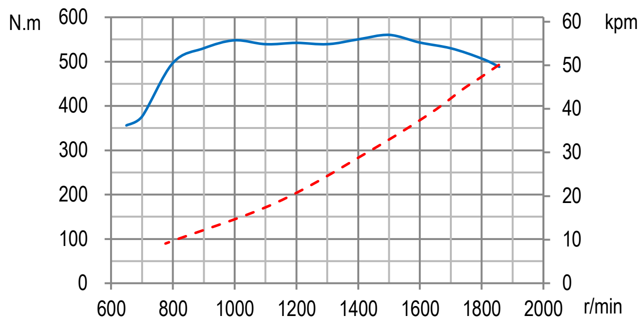
High Performance Duty (P5)

The engine can run at full load for 0.5h every 5h. The average load factor is about 60%. Annual working time is recommended but not limited to 500h.

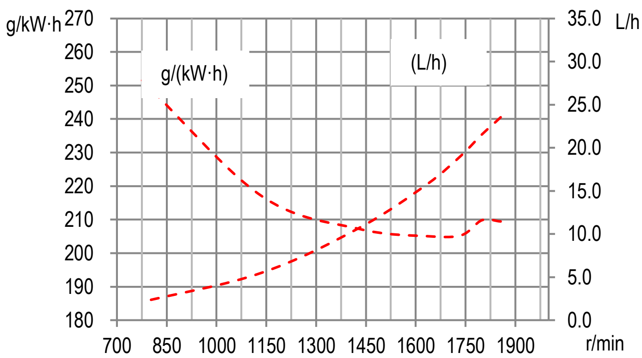
Power



Torque



Fuel consumption



Full load speed characteristics

Propeller characteristics

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Air intake system

Intake air flow-m^3/min(cfm)	6.5 (230.6)
Max. allowable intake air restriction- kPa(in H_2O)	6 (24.1)
Intake air temperature up to-°C(°F)	55 (131)
Heat rejection to atmosphere-kW(BTU/min)	11(625.6)

Cooling system

Coolant capacity of the engine-L(gal)	11.2(2.46)
Max. sea water strainer mesh hole diameter- mm(in)	2 (0.08)
Sea water pump flow-m^3/h(gal/h)	18 (3960)
Head of sea water pump -m(ft)	17(55.76)
Max. self-priming height of sea water pump- m(ft)	2(6.56)
Expansion tank pressure cap- kPa(psi)	50(7.3)
Heat dissipating to heat exchanger- kW(BTU/min)	48(2729.8)
Coolant flow-m^3/h(gal/h)	6.2(1364)
Temperature range of engine outlet -°C(°F)	70~95(158~203)
Temperature range of thermostat-°C(°F)	70~80(158~176)

Exhaust system

Exhaust flow-m^3/min(cfm)	17.9 (639.34)
Max. exhaust back pressure-kPa(in H_2O)	6 (24.10)
Max. exhaust temperature before turbocharger-°C(°F)	700 (1292)
Max. exhaust temperature after turbocharger-°C(°F)	550(1022)
Max. bending moment of turbocharger flange- N·m(ft·lbs)	10(7.4)
Exhaust smoke-FSN	≤2.0

Lubricating system

Max. install angle(fore-aft)	5°
Max. install angle(athwart ship)	15°
Max. operating angle(fore-aft)	7.5°
Max. operating angle(athwart ship)	22.5°
Sump type	Wet
Oil capacity Low/High-L(gal)	6.2/10.7 (1.36/2.35)
Oil consumption –g/(kW·h)	≤0.2
Oil flow- L/min(gal/min)	46.8 (10.3)
Oil pressure of idle speed- kPa(in H_2O)	≥120(≥482)
Oil pressure of rated speed- kPa(in H_2O)	350-600(1405-2410)

Fuel system

Fuel flow supply line- L/h(gal/h)	109.5 (24.1)
Fuel flow return line- L/h(gal/h)	87.69 (398.59)
Max. Allowable fuel supply restriction -kPa(in H_2O)	9 (36.1)
Fuel supply restriction on engine-kPa(in H_2O)	/ (/)
Allowable fuel restriction of shipyard supplied components-kPa(in H_2O)	/ (/)
Max. fuel return restriction-kPa(in H_2O)	12 (48.2)
Max. self-priming height of fuel delivery pump-m(ft)	1 (3.28)
Max. fuel inlet temperature-°C(°F)	50 (122)
Max. fuel inlet pressure- kPa(in H_2O)	10(40)

Starting system

Electrical system voltage(2-pole)-V	24
Electric starter power-kW(Ps)	6 (8.2)
Recommended battery capacity- A·h	165*2
Alternator working current-A	35

Security parameters

Alarm speed-rpm	2070
Shut down speed-rpm	2160
Alarm oil pressure-MPa	0.12
Shut down oil pressure-MPa	0.08
Alarm oil temperature-°C(°F)	105(221)
Alarm coolant temperature-°C(°F)	95(203)

Noise

Noise(SPL)- dB(A)	95.8

General remarks

- The origin of coordinates is at the center of the flywheel housing back end surface. X axis directs from flywheel to front, Z axis directs vertical up, Y axis direction is defined by right-hand rule.
- All ratings are based on operating conditions under ISO 8665, ISO 3046-1.
- Curves represent net engine performance in accordance with ISO 3046/1 with standard accessories such as fuel injection pump, water pump and L.O. pump under the condition of 25°C/77°F ambient temperature, 100kPa[29.612 in Hg] barometric pressure, 30% relative humidity and 25°C/77°F raw water temperature at inlet.